REMARKS/ARGUMENTS

Claims 1-7, 9-36, and 38-44 were pending. Claim 45 is entered, accordingly, claims 1-7, 9-36, and 38-45 are now pending.

Claims 1-7, 9-36, and 38-45 were variously rejected under 35 USC 103(a) by Jenkins (‘608) in view of Cook (‘400) For the reasons set forth below, these claims as amended, are asserted to be allowable over the cited art.

Claim 28 was rejected under 35 USC 112 ¶1. In response, the undersigned respectfully traverses this rejection. As disclosed in the present specification, the images or frames produced by various embodiments are recorded onto film. More specifically, the specification states:

> *FIG. 1 shows a computer system suitable for carrying out the invention. A main bus 1 is connected to one or more CPUs 2 and a main memory 3. Also connected to the bus is a keyboard 4 and large disk memory 5. The frame buffer 6 receives output information from the main bus and sends it through another bus 7 to either a CRT or another peripheral which writes the image directly onto film. ‘965 patent, col. 3, l.66-col.4, l.5.*

Additionally, it is well-known that images that are recorded onto film media are termed “frames.” Nevertheless, to reduce any chance of Examiner confusion, the term “frame” has been deleted from claim 28. More specifically, claim 28, now recites:

> *28. (currently amended) A ~~frame of~~ film comprising the image formed according to the method described in claim 1.*

In light of the above, it is asserted that the rejection of claim 28 under 35 USC 112 ¶1 has been traversed, or is now moot.

In response to the rejection of claim 38, claim 38 has been amended to remove reference to a canceled claim.

I. DISCUSSION

A. Claim 1

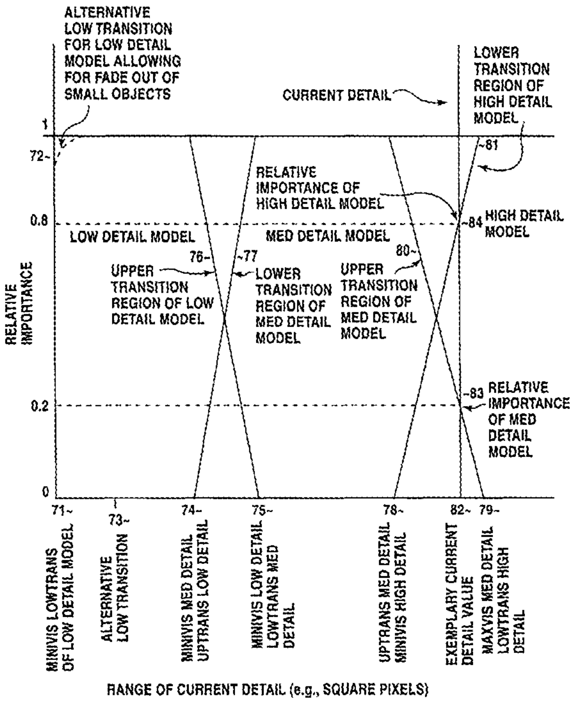
Claim 1, as amended, is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook. Additionally, it would not have been obvious to combine Jenkins and Cook. For example, the combination of these references fails to teach, disclose, or suggest the limitation of claim 1 that recites:

> *associating with each of said sample locations one of said plurality of different representations, wherein each of said plurality of different representations is pseudorandomly associated with one of said sample locations;*

Embodiments of the present invention relate to methods for smoothly transitioning between different object representations in computer animation incorporating stochastic sampling techniques. Abstract. As illustrated in various embodiments, to reduce "popping" visual artifacts, col. 2, l.1-3, different level of detail models are sampled for sub-pixel locations within a pixel. For example, the specification states:

> *In the example illustrated in FIG. 7, the current detail specifies that the high detail representation has importance 0.8 giving a range (0,0.8) and the medium detail representation has importance 0.2 giving a range (0.8, 1). So for a uniformly distributed m, 80% of the sample points will see the high detailed representation and 20% will see the medium detail representation. Col. 6, l.46-52.*

Fig.7



Claim 1 has been amended to be directed towards such embodiments. For example, claim 1, as amended, recites:

> *associating with each of said sample locations one of said plurality of different representations, wherein each of said plurality of different representations is pseudorandomly associated with one of said sample locations;*

Jenkins fails to disclose such a limitation. As previously described, in the context of Jenkins' system, Jenkins described in great detail when to determine additional sampling locations on an object, e.g. steps 905, 915, 925 935, 945, 955, and 965, based upon visible contrast between sampling locations K1 and K2 (Figs. 9A-B). In particular, Jenkins described increasing the level-of-detail, e.g. steps 998 and 999, when additional sampling is required. Jenkins described, for example:

> *On completion of step 970 control shifts to decision step 975 in which the adjusted contrast is returned. In a similar fashion to steps 990-994 the resolvability flags for the reprojected element (e.g. sample) are set to indicate the cause of the reduced resolvability as well as the level of resolvability of the sampled element.*
>
> *In the preceeding sequence the resolvability of two samples is determined based on their intersample contrast and a number of other factors that affect resolvablity. The results of this determination, in this example, are used to determine if additional spatial sampling is needed in a sampled region. Additionally, the results of this determination are used to determine a specific level-of-detail database representation that should be employed if further sampling is conducted in the region. This determination is represented as step 998 and 999 in FIG. 9.*

In other words, Jenkins describes that if the contrast / resolvability between two sampling locations K1 and K2 is large, an additional sampling location is selected, and a specific level of detail will be associated with that additional sampling location.

In light of the above, Jenkins clearly does not disclose the limitation of:

> *associating with each of said sample locations one of said plurality of different representations, wherein each of said plurality of different representations is pseudorandomly associated with one of said sample locations;*

Instead, at best, Jenkins discloses carefully selecting a level of detail for a sampling location, and not pseudorandomly associating a representation, as recited in claim 1, as amended. Cook also does not disclose this limitation, as Cook is silent as to different levels of detail.

Accordingly, the combination of Jenkins and Cook fails provide a prima facie case of obviousness.

Further, as previously argued, it is not obvious to one of ordinary skill in the art to combine Jenkins and Cook. For example, Jenkins describes a way to reduce artifacts (e.g. edge aliasing) through precise and exacting criteria for selecting points to sample on an object. As described in Jenkins above, if a contrast ratio is too high, in Jenkins, the solution is to continue sub-sampling until the contrast ratio is lowered.

In contrast, Cook recognized that the increased sampling approach to reduce aliasing, similar to Jenkins (see Cook. Fig. 4) was clearly inferior. For example, Cook described:

> *FIG. 4 illustrates a similar periodic point sampling technique, except that not all point samples are taken in each case. Rather, the full density of the periodic sampling*

> *pattern is employed only in regions of a pixel where changes in the object scene occur, such as represented by a line 35. This image dependent technique thus reduces the number of samples and the processing time required.*
>
> *But these and other periodic sampling techniques result in reconstructed images that include "aliases" of the real image to be displayed. Much effort has been directed to anti-aliasing techniques, one approach being to process the video signal obtained from a periodic pattern point sample technique in order to eliminate the aliasing effects of the technique. Col. 4, l.26-40.*

Accordingly, Cook recognized that type of techniques used by Jenkins were an inferior approach to object sampling.

Additionally, the combination of Jenkins and Cook would not even provide a workable solution. As asserted by the Examiner, Cook provides for pseudorandomly selecting sampling sub-pixel sampling locations. However, at best, Jenkins describes selecting additional sampling locations and level of detail based upon contrast of existing sampling locations. Jenkins, however, does not disclose how to select which level of detail to use for any arbitrary sampling location that would be selected by the Cook invention. In other words, Jenkins appears to rely upon increased sub-sampling to determine a level of detail and thus is not compatible with the pseudorandom selections provided by Cook.

In light of at least the above, claim 1, as amended, is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook as there is no prima facie case of obviousness, and it would not have been obvious to combine these references.

B. Claim 10

Claim 10 is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook. Additionally, it would not have been obvious to combine Jenkins and Cook. For example, the combination of these references fails to teach, disclose, or suggest the limitation of claim 10 that recites:

> *wherein a probability that each of said plurality of different representations is pseudorandomly associated with a particular one of said sample locations varies responsive to image based selection criteria;*

The Examiner's assertions with regards to Cook are respectfully traversed. Upon review of Cook, col. 5, l5-27, that section merely relates to assigning random number to sampling locations. Additionally, Cook, col. 7, l.17-31 merely relates to spatial sampling distribution of sampling locations. As can be seen, neither of these citations relate to associating different level of detail representations to a sampling location in the manner recited above. Further, nowhere in Cook is there any mention about different representations of objects.

In light of at least the above, claim 10, is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook as there is no prima facie case of obviousness. Additionally, for the reasons set forth above, it would not have been obvious to combine these references.

C. Claim 11

Claim 11 is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook. Additionally, it would not have been obvious to combine Jenkins and Cook. For example, the combination of these references fails to teach, disclose, or suggest the limitations of claim 11 that recites:

> *defining overlapping ranges of the selection criteria for which alternative ones of said plurality of different representations of the object may be utilized;*
>
> *defining, in said overlapping ranges of the selection criteria, transition functions that prescribe the importance of said alternative representations as a function of the selection criteria;*

The Examiner's assertions with regards to Cook are respectfully traversed. Upon review of Cook, col. 5, 5 – col. 6, l.21, that section merely relates to the pseudorandom aspect for selecting sampling locations within a pixel. As illustrated in Figs 5-7, the sampling locations are selected randomly within a specific region, e.g. 41, 43, 45, and 47. In particular, Cook states:

> *Each of the embodiments of FIGS. 5, 6 and 7 determines the location of the sample points within the pixel by first dividing the pixel into a number of non-overlapping areas equal to the number of sample points, in this case four. A sample point is confined within each such area, thus aiding in keeping the sample points spread out. The four areas of the pixel are labeled in the Figures as numbers 41, 43, 45 and 47. The areas are shown to be rectangular but can be some other shape.*

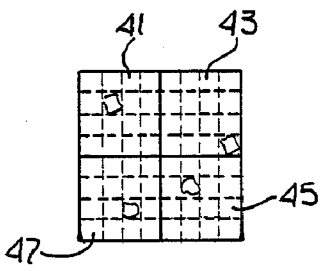


Fig. 5

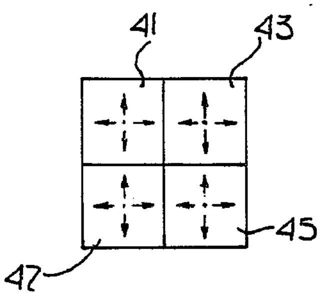


Fig. 6

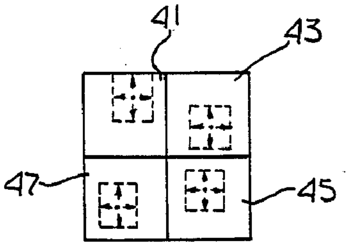
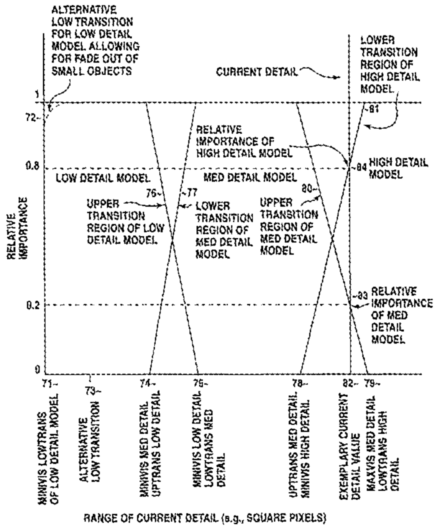


Fig. 7

As can thus be seen, this disclosure in Cook does not at all relate to the "overlapping ranges" for the selection criteria for a representation of an object that is recited in claim 11, or illustrated in the embodiment illustrated in Fig. 7 of the current patent application.

Fig.7



In light of at least the above, claim 11, is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook as there is no prima facie case of obviousness. Additionally, for the reasons set forth above, it would not have been obvious to combine these references.

D. Claim 15

Claim 15 is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook. Additionally, it would not have been obvious to combine Jenkins and Cook. For example, the combination of these references fails to teach, disclose, or suggest the limitations of claim 15 that recites:

> *establishing partitions of a range of a random variable, each of said partitions associated with one of said different representations of said object;*
>
> *associating each of said sample locations with one of said plurality of different representations based on the one of said partitions in which said value of said random variable associated with said sample location falls.*

The Examiner's assertions with regards to Cook are respectfully traversed. Upon review of Cook, col. 5, 5 – col. 6, l.21, that section merely relates to the pseudorandom aspect for selecting sampling locations within a pixel. As discussed above, with regards to claim 11, this disclosure in Cook does not at all relate to "partitions associated with … different representations" for the object that is recited in claim 15. Further, Col. 7, l.17-58 of Cook also merely relates to the distribution of sampling locations within a pixel.

In light of at least the above, claim 15, is not obvious under 35 U.S.C. 103(a) by Jenkins in view of Cook as there is no prima facie case of obviousness. Additionally, for the reasons set forth above, it would not have been obvious to combine these references.

E. Remaining claims

Claims 2-7, 9-17, 28 and 40-44 are asserted to be allowable for substantially the same reasons as claim 1, and more specifically, for the specific limitations they recite.

Independent claims 18 and 29, are asserted to be allowable for substantially the same reasons discussed above, and more specifically, for the specific limitations they recite.

Claims 19-27 are asserted to be allowable for substantially the same reasons as claim 18, and more specifically, for the specific limitations they recite.

Claims 30-39 and 45, are asserted to be allowable for substantially the same reasons as claim 29, and more specifically, for the specific limitations they recite.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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